

Claims

1. Flexible polyurethane foam obtained by reaction between a polyesterpolyol and a diisocyanate, characterized in that it has a density, determined according to ASTM standard D3574(A), of less than  $0.3 \text{ g/cm}^3$ , a hardness, measured according to NBR standard 14455 (Ascher C), of greater than or equal to 45 and a compression set, determined according to ASTM standard D 395 (B), of less than or equal to 12%.
2. Foam according to Claim 1, characterized in that the density is between  $0.1 \text{ g/cm}^3$  and  $0.25 \text{ g/cm}^3$  and preferably between  $0.15 \text{ g/cm}^3$  and  $0.23 \text{ g/cm}^3$ .
3. Foam according to either of Claims 1 and 2, characterized in that it has a tear strength, measured according to ASTM standard D 3574 (F), of greater than or equal to  $2.5 \text{ kg/cm}$ .
4. Foam according to one of Claims 1 to 3, characterized in that it has a tensile breaking stress, measured according to ASTM standard D 412, of greater than or equal to  $18 \text{ kg/cm}^2$ .
5. Foam according to one of Claims 1 to 4, characterized in that it has an elongation at break, measured according to ASTM standard D 412 (C), of greater than or equal to 250%.
6. Foam according to one of Claims 1 to 6, characterized in that it has a moulding shrinkage, determined according to SATRA standard TM 70, of less than or equal to 1.0%.

7. Foam according to one of the preceding claims, characterized in that it contains a dispersed mineral particulate filler in a weight concentration of between 0.8% and 8% relative to the total weight of the foam.
8. Foam according to Claim 3, characterized in that the mineral filler particles have a mean size of less than 60  $\mu\text{m}$ .
9. Foam according to Claim 8, characterized in that the mean size of the particles is less than 20  $\mu\text{m}$  and preferably less than 10  $\mu\text{m}$ .
10. Foam according to one of Claims 7 to 9, characterized in that the mineral filler is chosen from the group comprising aluminosilicates, silicas, titanium oxides, talc, calcium carbonate, mica and kaolin.
11. Foam according to Claim 10, characterized in that the mineral filler is a precipitation silica.
12. Foam according to one of the preceding claims, characterized in that the polyesterpolyol is obtained by reaction between a diol and a diacid or a mixture of diacids comprising at least adipic acid and at least one diacid containing 5 carbon atoms or less.
13. Foam according to Claim 12, characterized in that the diacid containing less than 5 carbon atoms is glutaric acid.
14. Process for manufacturing polyurethane foam according to one of the preceding claims, characterized in that it consists, in a reactive extrusion process, in feeding in a diisocyanate compound, a composition

formed by a suspension of mineral fillers in a polyesterdiol, a catalyst and a foam-forming agent, the said foam-forming agent being present in an amount required to obtain the desired density.

15. Process according to Claim 14, characterized in that the composition formed by a suspension of mineral fillers in a polyesterdiol is obtained by reacting a diol compound with at least one diacid in an esterification step, followed by a polycondensation until the desired degree of polymerization is obtained, the diacid being adipic acid, and in that the mineral filler is dispersed in or fed into the reaction medium either before the esterification step or at the start of the polymerization step.
16. Process according to Claim 15, characterized in that the diacid is a mixture of adipic acid and of diacids containing 5 carbon atoms or less.
17. Process according to Claim 15, characterized in that the diacid is a mixture of adipic acid, glutaric acid and succinic acid.
18. Process according to Claims 15 to 17, characterized in that the diacid is a mixture of adipic acid and AGS.
19. Process according to Claim 18, characterized in that the concentration of adipic acid in the acid mixture is between 2% and 20% by weight.
20. Process according to one of Claims 14 to 19, characterized in that the mineral filler is added to the esterification medium as a mixture with at least some of the diacids.

21. Use of a polyurethane foam according to one of Claims 1 to 13, for the manufacture of moulded articles.
22. Use of polyurethane foam according to one of Claims 1 to 13, for the manufacture of shoe midsoles.
23. Shoe midsole obtained by moulding a polyurethane foam according to one of Claims 1 to 13.
24. Shoe comprising at least a portion of the sole made of polyurethane foam according to one of Claims 1 to 13.